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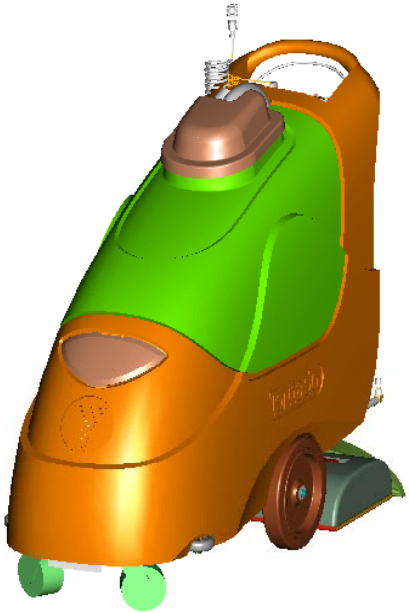
TORNADO

MARATHON 2000
FORWARD ONLY EXTRACTOR



CATALOG NO.
98190 (115V, 60HZ)

OPERATIONS/SERVICE MANUAL

Form No. L8190AD FOR COMMERCIAL USE ONLY

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This illustrated parts book covers:

CATALOG NO.	98190
SERIES	"D"
SIZE	22"
CAPACITY	20 Gal.
VOLTS	115V
AMPS	15

All specifications are subject to change without notice.

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Tornado® Standard Warranty Program*

10 Years: All plastic tanks and rotationally-molded bodies
2 Years: Parts and Labor on all Tornado and Tornado/Karcher cleaning equipment **
1 Year: Warranty on batteries, one full year, not pro-rated.

Warranties do not cover components subject to normal wear or abuse and misuse, and have other limitations not specified here. For full details, contact your Authorized Tornado Distributor, Service Center, or the Tornado Technical Service Department.

* Effective January 1st, 2000. Terms subject to change without notice.

**** Windshear™ Blower-Dryer, Insulation Blowers, CW 50, CW 100, and Duo Upright Carpetkeepers™ are warranted for 1 (one) year for parts and labor.**

IMPORTANT SAFETY INSTRUCTIONS
FOR COMMERCIAL USE

WHEN USING AN ELECTRICAL APPLIANCE, BASIC PRECAUTIONS SHOULD ALWAYS BE FOLLOWED INCLUDING THE FOLLOWING:

READ ALL INSTRUCTIONS BEFORE USING THIS MACHINE

WARNING: TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY:

1. Do not leave machine when plugged in. Unplug from outlet when not in use and before servicing.

2. Use indoors only. Do not use outdoors and do not expose to rain.

3. Do not allow to be used as a toy. Close attention is necessary when used by or near children.

4. Use only as described in this manual. Use only manufacturer's recommended attachments.

5. Do not use with damaged cord or plug. If machine is not working as it should, has been dropped, damaged, left outdoors, or dropped into water, return it to a service center.

6. Do not pull or carry by cord, use cord as a handle, close a door on cord, or pull cord around sharp edges or corners. Do not run machine over cord. Keep cord away from heated surfaces.

7. Do not unplug by pulling on cord. To unplug, grasp the plug not the cord.

8. Do not handle plug or machine with wet hands.

9. Do not put any object into openings. Do not use with any opening blocked; keep free of dust, lint, hair, and anything that may reduce air flow.

10. Keep hair, loose clothing, fingers, and all parts of body away from openings and moving parts.

11. Turn off all controls before unplugging.

12. Use extra care when cleaning on stairs.

13. Do not use to pick up flammable or combustible liquids, such as gasoline or use in areas where they may be present.

14. Connect to a properly grounded outlet only. See Grounding Instructions.

SAVE THESE INSTRUCTIONS

BEFORE OPERATING THE MACHINE

Read the manual carefully and completely before attempting to operate the unit. This manual has important information for the use and safe operation of the machine. Keep this manual on file and handy. This machine will assure years of satisfactory service if operated and maintained according to recommendations in the manual. If additional information is needed, please contact your local distributor or call:

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All information and specifications printed in the manual and parts list are current at the time of printing. However because of Breuer's policy of continual product improvement, we reserve the right to make changes at any time without notice.

This machine was shipped with window washer antifreeze, during the winter months, in the solution line system to protect the pump and valves from freezing during transportation and storage. Before you use the unit, rinse the solution line system with clean water (refer to Protect From Freezing).

WARRANTY

To protect your investment, promptly fill out the required information on the warranty card that comes with the unit and mail it back to Tornado Industries

GENERAL PRECAUTIONS

- Make sure the machine is plugged into an electrical outlet with the same voltage and frequency rating as shown on the nameplate of the machine. Do not attempt to plug a 115 volt machine in a 230 volt outlet.
- Disconnect power cord from the outlet before attempting maintenance or repair work. Do not leave machine connected to an electrical outlet when unattended.
- Don't abuse power cord. Never pull the machine by the cord or yank plug from the receptacle. If this machine is operated on a wet carpet a potential shock hazard can be caused by a damaged cord. Replace a damaged cord immediately.
- Do not immerse this machine in standing water. Such use can cause electrical shock.
- Do not use volatile substances such as gasoline or kerosene in the machine, on or near the surface to be cleaned. The use of such materials could cause an explosion and fire.
- If an extension cord is necessary, use a 3 conductor grounding cord, 12 gauge wire to prevent motor burnout, overheating of the wiring.
- To avoid electrical shock, do not expose to rain and store indoors.

WARNING

The machine was designed for use on carpeted floors as per instructions and recommendations written in this manual. Any deviation from its proper use or purpose and the consequential damage that may occur is the sole responsibility of the end user.

- Do not use the machine for **dry** vacuuming. This machine is not fitted with a dry filter.
- Use defoamer in the recovery tank at all times to prevent damaging the vacuum motor.
- Do not use water in excess of 140 degree F (62 degree C).
- Use only commercially available **low** foaming carpet cleaners and defoamers intended for machines of this type. Do not use dyes, bleaches, ammonia or other additives. The use of powdered cleaning solution if not diluted properly many result in the intake screen clogging or damage to the pump.
- Do not expose machine to freezing temperatures.
- Do not attempt to repair warranted machines. All repairs must be done by a qualified and authorized repair center. Non warranted repairs will be billed back to the owner of the unit.
- Do not use any replacement parts except those specified in the parts list. Unauthorized parts will void the warranty and could cause the unit not to function properly.

FAILURE TO COMPLY WITH THE ABOVE WARNING INSTRUCTIONS WILL VOID THE WARRANTY

ELECTRICAL

This machine operates on a standard, 15AMP,115 volt AC circuit and has a grounded plug.* Make sure the machine is connected to an outlet having the same configuration as the plug. **No ungrounded adapter should be used with this machine.**
***Special voltage models available.

GROUNDING INSTRUCTIONS

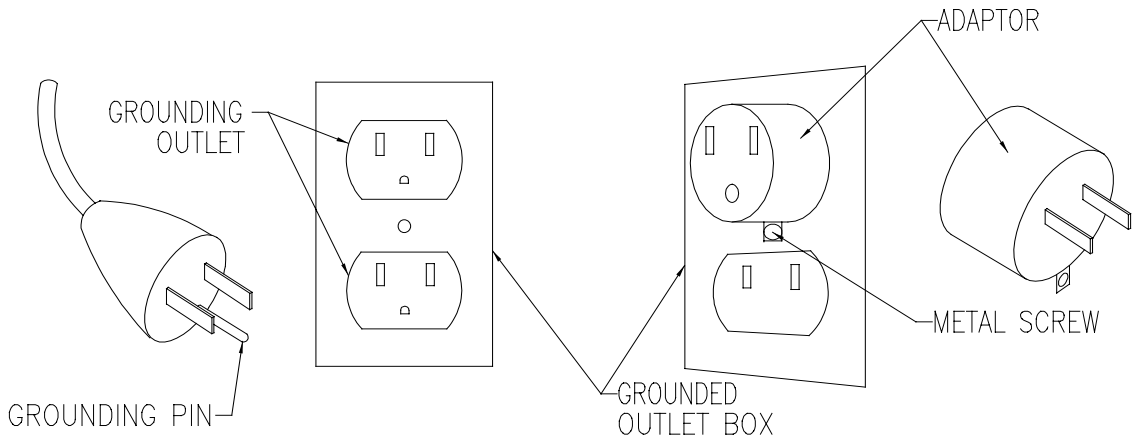
This machine must be grounded. If it should malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk electric shock. This machine is equipped with a cord having an equipment -grounding conductor and grounding plug. The plug must be inserted into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.

WARNING:

Improper connection of the equipment-grounding conductor can result in a risk of electric shock. Check with a qualified electrician or service person if you are in doubt as to whether the outlet is properly grounded. Do not modify the plug provided with the appliance - if it will not fit the outlet, have a proper outlet installed by a qualified electrician.

This machine is for use on a nominal 120-volt circuit, and has a grounding plug that looks like the plug illustrated in sketch A. A temporary adapter that looks like the adapter illustrated in sketches B and C may be used to connect this plug to a 2-pole receptacle as shown in sketch B if a properly grounded outlet is not available. The temporary adapter should be used only until a qualified electrician can install a properly grounded outlet (sketch A). The green-colored rigid car, lug, or the like extending from the adapter must be connected to a permanent ground such as a properly grounded outlet box cover. Whenever the adapter is used, it must be held in place by a metal screw.

NOTE: In Canada, the use of a temporary adapter is not permitted by the Canadian Electrical Code.



STRAIN RELIEF

Attaching the strain relief/cord retainer to the 50’ power cord.

1. Make a loop in power cord approximately 12” from receptacle end.
2. Slide cord loop through slot in retainer and over retainer arm. Pull slack cord back through slot to secure. Attach retainer to handle.

EXTENSION CORD

If an extension cord is used, the wire size must be at least one size larger, (12-3) than the power cord on the machine.

REQUIRED CLEANING CHEMICALS

Use only commercial low foam cleaning chemicals that are designed for carpet extraction.

1. General carpet extraction cleaner added to the solution tank.
2. Traffic lane per-spray usually applied with spray wand.
3. Defoamer only goes into the recovery tank.

CAUTION: Use as directed. Do not over use the cleaning chemicals.

CLEANING TIPS

- Check the condition of the carpeting. If the carpet is loose, heavily soiled, stained, spotted or badly worn, point this out to the person in charge.
- Locate an inconspicuous spot on the area to be cleaned. Test carpet for colorfastness before proceeding. Pour the concentrated cleaning solution on the spot, cover with a white towel and place a heavy object on top to absorb the cleaning solution. Wait 10 minutes for any reaction to take place. Remove weight. If there is no color transfer, it should be safe to clean.
- Remove the furniture from the area to be cleaned. Large pieces can be moved to opposite end of the room from where you start cleaning and replace when it is completed. After cleaning carpet, place a small square of aluminum foil or 6 mil poly square under the furniture legs to prevent moisture from damaging the finish or rusting the metal glides.
- Clean the area first with a Clean-Air Carpetkeeper, upright vacuum. Do not use the Marathon as a dry vacuum! Heavily soiled carpet or areas of concentrated foot traffic should be treated with recommended pre-spotting or pre-spray chemicals, using a hand spray trigger bottle or pump up sprayer. Do not allow any spotter or pre-spray to dry on the carpet.
- Identify the type of carpet fiber to be cleaned. Most commercial carpet fibers in use are nylon or acrylic based. Best results in cleaning would be obtained if hot water is used to clean these types of fibers. On the other hand, hot water could shrink natural fiber carpeting, like wool and cotton in particular. Exercise caution when cleaning natural fibers. Use cool water test for colorfastness and apply the least amount of cleaning solution possible.
- Plan your cleaning route. Always try to have the cord to the right of the Marathon extractor so you are working away from the cord. Operate the extractor in parallel passes. Clean the perimeter last. Turn “off” spray switch in turns to conserve cleaning solution**.**
- To decrease dry time, go over the carpet without pressing carpet spray switch. To further decrease the drying time, use the Windshear 3000 Carpet Blower.
- When running the extractor, do not overfill the recovery tank. Do not allow the water level to rise above the clear dome on top of the recovery tank.
- If the spray jets become clogged, remove the spray bar assembly or the individual spray tips and soaks them in a mild acid or anti-browning chemical to dissolve normal alkaline chemical buildup.
- When the extractor runs out of cleaning solution, noted by streaking or incomplete cleaning, turn off the machine and drain the recovery tank. Refill as needed and continue cleaning.

MACHINE SPECIFICATIONS

- ***ELECTRICAL :*** 115 V, 15 A, 60 HZ.
- ***DURABLE EXTENSION CORD :*** 75’
- ***DRIVE SYSTEM :*** TRANSAXLE W/ VARIABLE SPEED, (0-100 FT/MIN)
- ***VACUUM MOTOR:*** 3 STAGE, 1 HP., 120 CFM
- ***VACUUM SHOE :*** 22” WIDE, CAST ALUMINUM, ADJUSTABLE, FLOATING ARM
- ***BRUSH :*** 19” LONG
- ***BRUSH SPEED / HP :*** 1000 RPM / 1/4 HP
- ***SOLUTION PUMP :*** 100 PSI, DIAPHRAGM STYLE
- ***SOLUTION CAPACITY :*** 20 GALLONS
- ***RECOVERY CAPACITY :*** 20 GALLONS
- ***WHEELS :*** FRONT (4” DIA.), REAR (10” DIA.)
- ***SPRAY SYSTEM :*** (4) QUICK CHANGE JETS, LEVER TRIGGER SPRAY WAND
- ***EMPTY WEIGHT :*** 190 LBS.
- ***FULL WEIGHT :*** 350 LBS.
- ***LENGTH :*** 51”
- ***HEIGHT :*** 37.5”
- ***WIDTH :*** 22”

OPERATION INSTRUCTIONS

Main Controls:

Your extractor is equipped with (4) main switches, which control the spray bar, the brush motor, the vacuum motor and the main power. The main switch must be activated before operating the transaxle drive. The machine will glide easily across the floor when pushed forward (without power).

WARNING:

In order to avoid injury, it is recommended that the extractor be pulled in the reverse direction (without power) in emergency situations only.

In addition, there are (4) main circuit breakers, (located on the front of the main control panel):

- (20 amp) circuit breaker – main power
- (15 amp) circuit breaker – vacuum motor
- (2.5 amp) circuit breaker – transaxle drive
- (2.5 amp) circuit breaker – brush motor drive

Set Up and Operation:

Your Marathon is shipped complete and ready for carpet cleaning. This style of machine is sometimes referred to as a self-contained extractor, since everything is included in the body of the extractor.

1. Install recovery tank cover to the top of the tank and connect the suction hose to the cover.
2. Open filler door at the front of the tank and fill with hot water. Add liquid cleaning solution to proper dilution ratio. Use separate buckets to fill and empty extractor. Avoid using undissolved soap or chemicals which could potentially plug the spray jets.
3. Attach a 12 gage extension cord to the pig tail plug on the machine.

WARNING:

To avoid serious injury: Plug into a grounded (earth) outlet only. Do not use an adapter or remove ground pin on plug. Do not use a damaged cord.

4. Activate the main power switch. NOTE : THE MAIN POWER SWITCH WILL TURN OFF ALL THE OTHER CONTROLS ON THE MACHINE
5. Lower the manual release lever and allow the brush assembly to rest on the floor. The height of the suction nozzle may need to be adjusted using the turn knob.
6. Activate the vacuum motor switch.
7. Activate the brush motor switch.
8. Activate the spray bar switch. Remember to turn off this switch about 6” from the end of each cleaning pass.
9. Squeeze the trip lever on the main handle to move the extractor forward. The machine has a powered transaxle, so forward movement will be quick and easy. Turn the variable speed control clockwise to increase the forward speed.

12. As you are cleaning, monitor the water level in the recovery tank cover. An overflow of water in the recovery tank can damage the vacuum motor. Always be aware of this water level.
13. The recovery tank can be drained by removing the drain hose from its support clip and removing the drain plug. The standpipe in the recovery tank is equipped with a metal screen cap. This cap is accessible by removing the clear dome on top of the unit. It is recommended that this cap be cleaned after every machine use.
14. The solution tank has a clear see through drain hose, which tells the operator the tank level. The water in the solution tank can be drained using this hose.
15. While cleaning, pre-spray traffic areas and spots using the spray wand. The spray wand is attached to a quick disconnect and is pressurized when the MAIN SWITCH is turned on.

WARNING:

To avoid serious injury: Disconnect power before servicing. Electrical service must be performed by an authorized service station or electrician. Use only nonflammable commercial chemicals intended for machine application. Do not use where explosive vapors or dust are present in the air. Disconnect power if the machine is left unattended. Do not allow machine to freeze. Do not expose to rain, store machine indoors.

Daily Maintenance:

1. Rinse out the recovery tank and clean the recovery dome. In addition, remove and clean the recovery screen cap.
2. Drain the solution tank and clean with water.
3. Remove any debris in either the recovery or solution tank.
4. Flush the pumping system with clean warm water or white vinegar.
5. Remove lint or debris from the vacuum shoe or brush. Hint: if heavy lint build-up is present, use a hacksaw blade with teeth down to remove the lint.

Periodic Maintenance:

- It is highly recommended that once a month you flush the Marathon out with a 8 to 1 ratio of water to white vinegar or anti-browning solution through the extractor. This will help to prevent the build up of alkaline residue.
- If the spray jets become clogged, remove and wash them thoroughly and blow dry. Do not use wire or pins to clean the nozzles as this will cause the spray pattern to become distorted, thereby creating a streaking pattern on the carpeting.
- If the spray jets drip after the pump is turned off, the solenoid valve may need to be cleaned.
- Once a month, inspect all electrical cables, hoses, filters and connections in the Marathon. If you see something that should be repaired or replaced it should be reported and repaired. Little things are easy to forget about, but as these little things add up, you end up with a cluster of problems that will cost you in the long run.

CAUTION: When opening the Marathon for service and/or inspection, be sure that the recovery hose is in its proper position. If not, the hose can become crushed and you will not get good airflow from the vacuum nozzle.

- Be sure to use Tornado genuine parts and service is provided by an authorized Tornado Service Center. Use of non-O.E.M. parts will void the warranty.

PROTECT FROM FREEZING

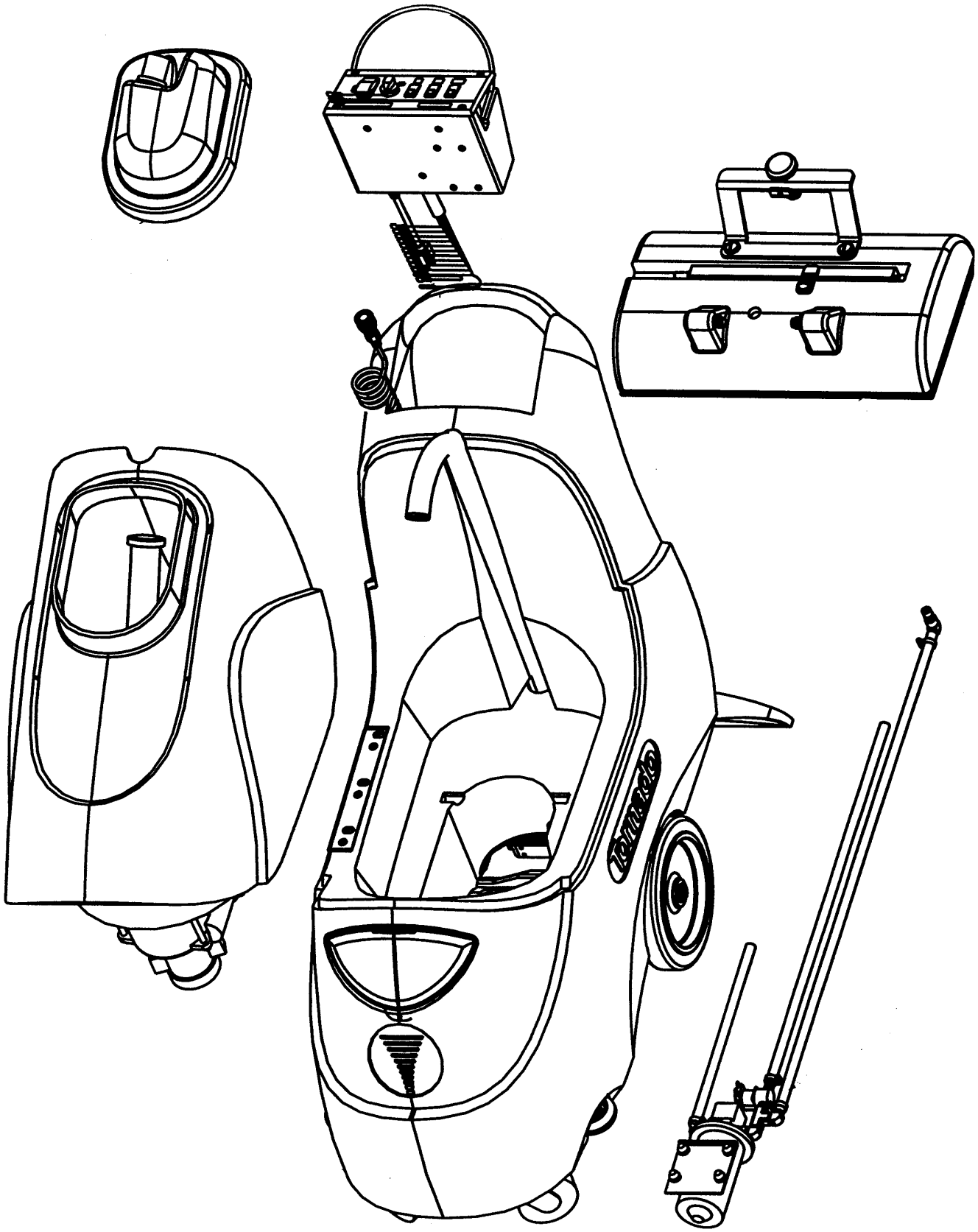
If it becomes necessary to store in temperatures that could drop below 40 degrees F, the pumping system, hoses and valves must be protected from freezing with a methyl hydrate window washer antifreeze solution. Do not use ethylene glycol or cooling system antifreezes.

1. Add a half gallon of window washer antifreeze to the solution tank, turn on the brush switch and press the spray switch until the antifreeze solution fills the solution lines.
    - Always allow the unit to reach room temperature before turning on the Marathon to expel the antifreeze.

Trouble Shooting Table:

Problem	Solution
No Power, Nothing Works	* Plug in Cord, Check Circuit Breakers
	* Activate Main Power Switch
	* Check For Loose Wiring
	* Call Service
Machine Will Not Move Forward	* Reset Circuit Breaker
	* Turn Speed Control Knob Clockwise
	* Call Service
Brush Does Not Rotate	* Reset Circuit Breaker
	* Activate Brush Switch
	* Check For Loose Wiring
	* Call Service
Poor Water Spray	* Spray Jets Clogged-Remove Spray
	Bar and Clean Spray Jets
	* Check Pump-Remove Spray Bar
	And Check water Flow
	* Call Service
Vacuum Motor Runs But Poor Suction	* Remove Debris From Vac Shoe
	* Recovery Tank Too Full-Drain Tank
	* Remove Debris From Suction Hose
	* Call Service
Vacuum Motor Will Not Run	* Activate Vacuum Switch
	* Reset Circuit Breaker
	* Check For Loose Wiring
	* Call Service

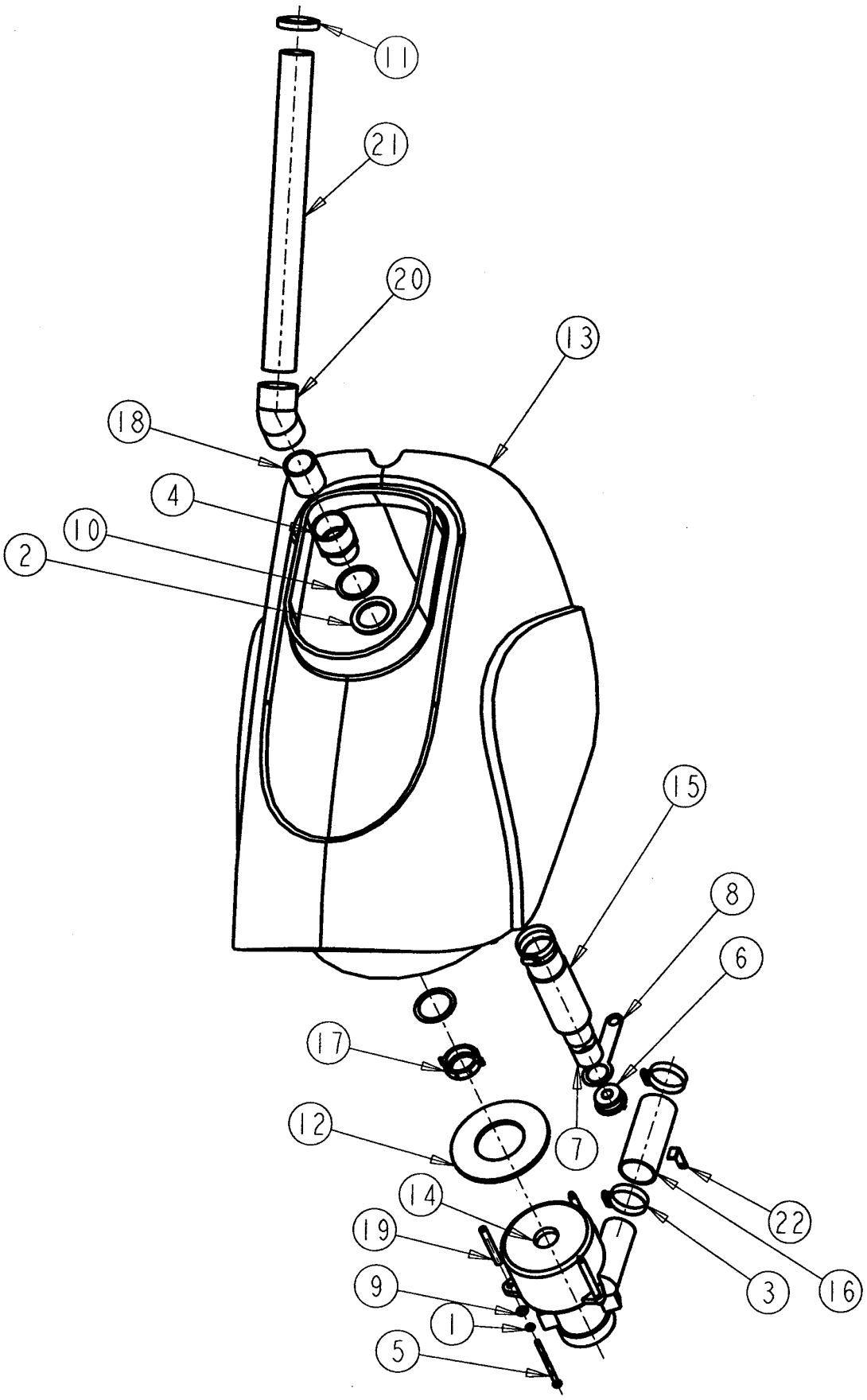
MAIN ASSEMBLY



UPPER TANK ASSEMBLY
(REF. #30642)

BILL OF MATERIALS			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	3	01574	LOCK WASHER 1/4"
2	1	05781	GASKET
3	3	14858	CLAMP-HOSE (SCREW)
4	1	15088	MALE ADAPTER 1-1/2
5	3	17644	SCREW-HEX HEAD CAP 1/4-20 X 4.00
6	1	18226	PLUG
7	1	18357	ALUMINUM SLEEVE
8	1	18358	RUBBER ATTACHMENT
9	3	18885	WASHER-PLAIN 1/4
10	2	18886	WASHER-PLAIN 2.000
11	1	19097	FILTER-VAC MOTOR INTAKE (STANDPIPE)
12	1	19119	GASKET-VAC MOTOR
13	1	30022	TOP TANK
14	1	30041	VAC MOTOR
15	1	30051	DRAIN HOSE-TOP TANK
16	1	30066	EXHAUST HOSE
17	1	30067	NUT-PVC-VAC STAND PIPE
18	1	30069	PIPE 2"LG-VAC STAND PIPE
19	3	30070	SPACER-VAC MOTOR
20	1	30563	ELBOW-VAC STAND PIPE
21	1	30564	PIPE-LONG-VAC STAND PIPE
22	1	30584	BRACKET-EXHAUST HOSE
23	1	30065	GROUND WIRE-VAC MOTOR

* ITEMS NOT SHOWN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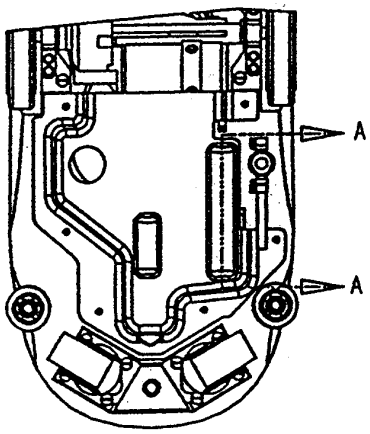
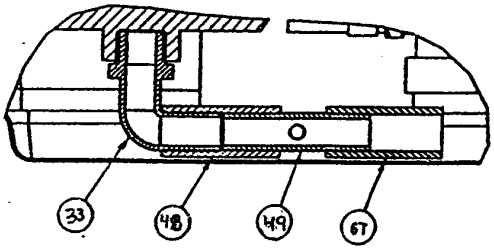
LOWER TANK ASSEMBLY
(REF. #98190)

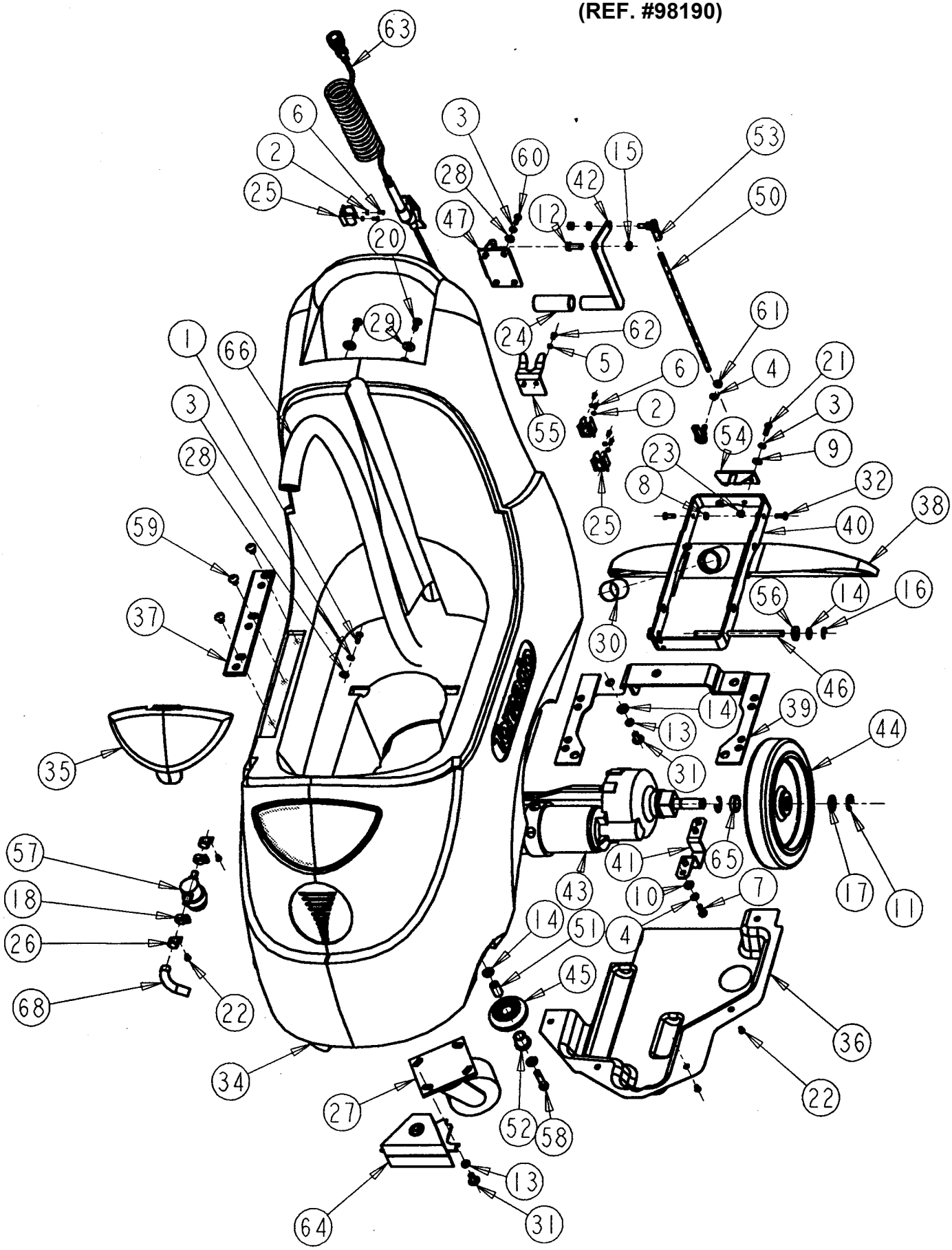
BILL OF MATERIALS			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	00064	SCREW-PHILLIPS OVAL HEAD MACHINE 1/4-20 X 3/4
2	6	01246	LOCK WASHER #6
3	7	01574	LOCK WASHER 1/4"
4	10	01577	LOCK WASHER 5/16"
5	2	01713	LOCK WASHER #10
6	6	01734	SCREW-PHILLIPS ROUND HEAD MACHINE #6-32 X 3/8
7	8	02109	SCREW-HEX HEAD CAP 5/16-18 X 3/4
8	4	02217	NUT-HEX JAM LOCK (NYLON INSERT) 1/4-20
9	2	03218	WASHER-PLAIN 1/4
10	8	03301	WASHER-PLAIN 5/16
11	4	03313	RING RETAINING EXT. 3/4"
12	1	03320	SCREW-HEX HEAD CAP 3/8-16 X 1.000
13	13	03536	LOCK WASHER 3/8"
14	11	03736	WASHER-PLAIN 3/8
15	1	03868	NUT-HEX JAM LOCK (NYLON INSERT) 3/8-16
16	2	03947	RING RETAINING EXT. 3/8"
17	2	03960	WASHER-PLAIN 25/32
18	2	07626	CLAMP-HOSE 5/16"-7/8" SCREW
19	2	15061	CLAMP-NOZZLE BAR
20	3	15067	SCREW-PHILLIPS PAN HEAD MACHINE 5/16-18 X 3/4
21	2	16459	SCREW-HEX HEAD CAP 1/4-20 X 3/4
22	12	16583	SCREW-PHILLIPS PAN HEAD MACHINE #10-24 X 3/8
23	2	17508	NUT-FINISHED HEX 1/4-20
24	1	18251	GRIP-HANDLE
25	3	18468	CLIP-HOSE
26	4	18717	CLAMP-CABLE (5/8" DIA.)
27	2	18773	CASTER-SWIVEL
28	5	18885	WASHER-PLAIN 1/4
29	3	19191	WASHER-PLAIN 5/16" SS
30	1	19197	TUBE-NOZZLE HOSE ADAPTER
31	13	19207	SCREW-SLOTTED TRUSS HEAD MACHINE 3/8-16 X 3/4
32	4	19254	SCREW-PHILLIPS PAN HEAD MACHINE 1/4-20 X 3/4
33	1	23292	FITTING, ELBOW 1/2NPT X 1 TUBE
34	1	30021	BOTTOM TANK
35	1	30026	INLET COVER-BOTTOM TANK
36	1	30027	COVER-PUMP
37	1	30030	HINGE
38	1	30031	VACUUM NOZZLE
39	1	30032	BRACKET-BOTTOM TANK
40	1	30033	BRACKET-NOZZLE
41	2	30035	BRACKET-TRANSAXLE
42	1	30036	LIFT HANDLE
43	1	30040	TRANSAXLE
44	2	30043	WHEEL
45	2	30044	WHEEL-BUMPER
46	1	30048	ROD-BRUSH ATTACHMENT
47	1	30049	BRACKET-LIFT HANDLE
48	1	30053	HOSE-TANK TO TEE
49	1	30054	TEE
50	1	30056	ROD-LIFT HANDLE
51	2	30570	SPACER-BUMPER WHEEL
52	2	30571	BUSHING-BUMPER WHEEL
53	2	30577	BALL JOINT - HANDLE
54	1	30578	BRACKET-ADJUSTING SCREW
55	1	30580	BRACKET-DRAIN HOSE
56	2	30581	SPACER-BRUSH ROD
57	1	30585	SOLUTION FILTER
58	2	30660	SCREW-HEX HEAD CAP 3/8-16 X 1-5/8
59	6	30673	SCREW-PHILLIPS ROUND HEAD MACHINE 3/8-16 x 1/2
60	4	30674	SCREW-PHILLIPS PAN HEAD MACHINE 1/4-20 X 5/8
61	2	30675	NUT-FINISHED HEX 5/16-24
62	2	30678	SCREW-PHILLIPS PAN HEAD MACHINE #10-24 X 3/8
63	1	30687	ASS'Y SPRAY WAND
64	1	30704	ASS'Y-FRONT WEIGHT
65	2	30922	SPACER
66	1	30050	HOSE-NOZZLE
67	1	30052	HOSE-DRAIN BOTTOM TANK
68	1	30575	HOSE-3/8 X 4" LG





SECTION A-A

LOWER TANK ASSEMBLY
(REF. #98190)

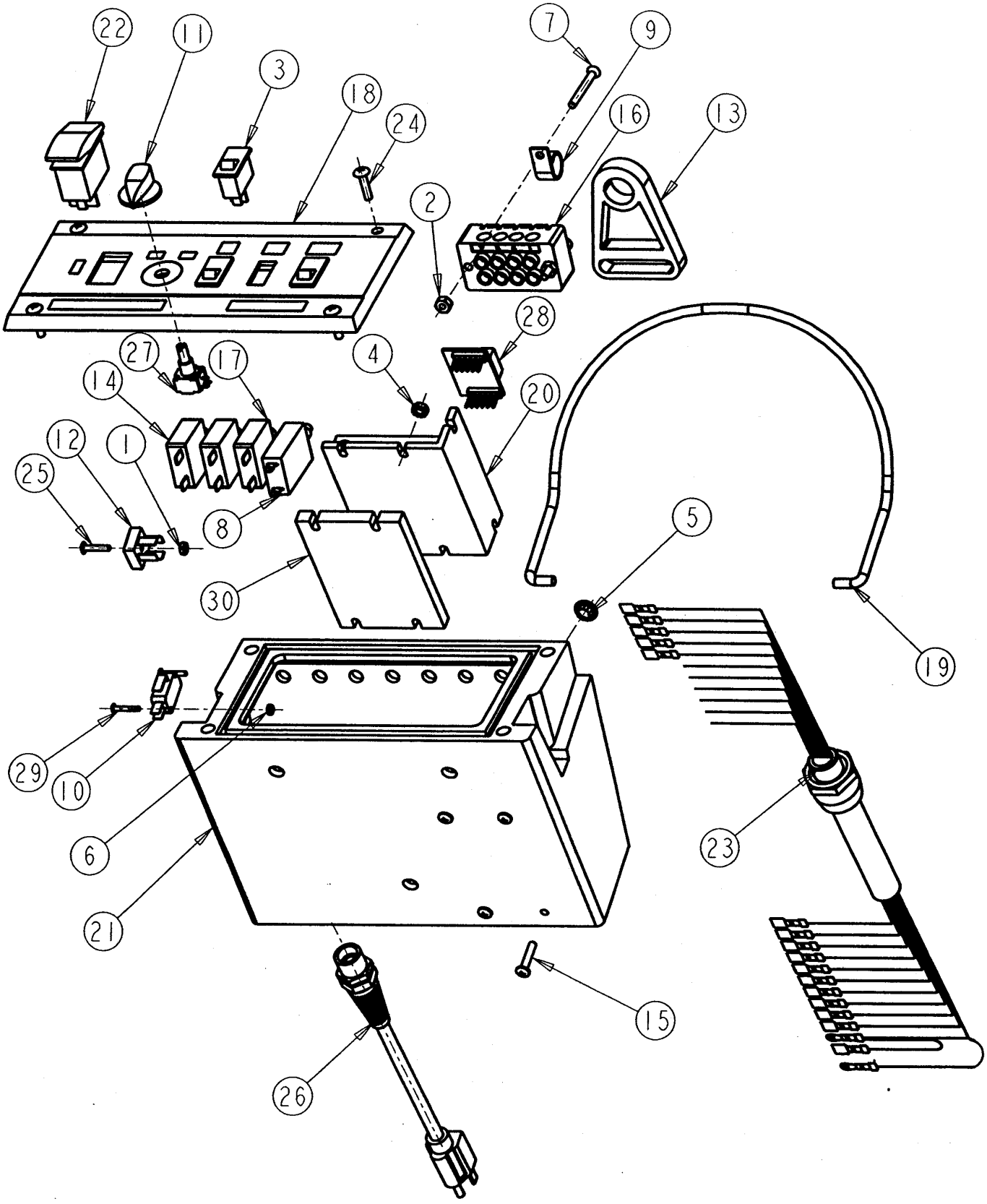


CONTROL PANEL ASSEMBLY
(REF. # 30644)

BILL OF MATERIALS			
ITEM	QTY	PART #	DESCRIPTION
1	1	00616	NUT-FINISHED HEX #6-32
2	2	01604	NUT-FINISHED HEX #10-32
3	3	10670	SWITCH-ROCKER
4	4	10892	NUT-#10-24 (KEPS)
5	1	14624	PLUG-HOLE
6	2	15560	NUT-#4-40 (KEPS)
7	2	16433	SCREW-PHILLIPS FLAT HEAD MACHINE #10-32 X 1-3/4
8	1	17780	CIRCUIT BREAKER 20 AMP
9	1	18717	CLAMP-CABLE (5/8" DIA.)
10	1	18818	SWITCH-MOMENTARY
11	1	18863	KNOB-SPEED CONTROL
12	1	19182	RECTIFIER-AC 8 AMP
13	1	19261	BELT CLIP-CORD CONTROL
14	2	19310	CIRCUIT BREAKER-2.5 AMP
15	4	19617	SCREW-PHILLIPS PAN HEAD MACHINE #10-24 X 1.000
16	1	19879	BLOCK TERMINAL
17	1	19990	CIRCUIT BREAKER 15 AMP
18	1	30028	CONTROL PANEL
19	1	30038	ROD-DRIVE ACTUATION
20	1	30042	PC BOARD
21	1	30224	CONTROL HOUSING
22	1	30241	SWITCH-MAIN-ROCKER
23	1	30566	WIRE HARNESS
24	4	30676	SCREW-PHILLIPS TRUSS HEAD MACHINE #10-24 x 7/8
25	1	30677	SCREW-PHILLIPS TRUSS HEAD MACHINE #6-32 x 3/4
26	1	30688	ASS'Y POWER CORD
27	1	30698	ASS'Y POTENTIOMETER WIRE
28	1	30699	DAUGHTER BOARD
29	2	30703	SCREW-PHILLIPS TRUSS HEAD MACHINE #4-40 x 3/4
30	1	30880	HEAT-SINK PLATE
31	1	30700	CONTROL WIRE BOX SET *

* ITEMS NOT SHOWN

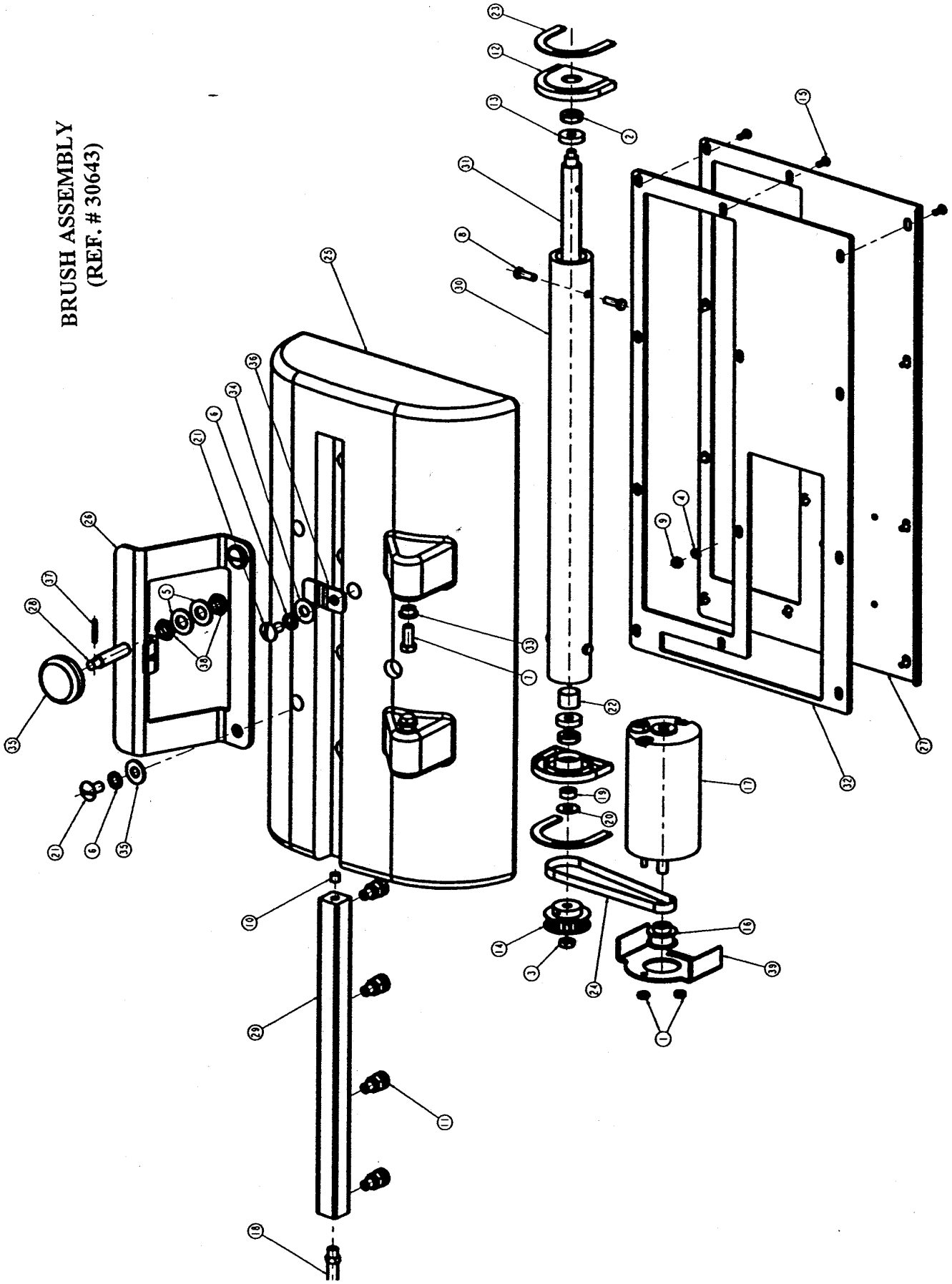
CONTROL PANEL ASSEMBLY
(REF. # 30644)



BRUSH ASSEMBLY
(REF. # 30643)

BILL OF MATERIALS			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	02625	NUT-HEX. LOCK (KEPS) #10-32
2	2	05209	BEARING-RADIAL BALL
3	1	05282	NUT-HEAVY HEX JAM
4	1	11007	WASHER-LOCK (I/T) #10
5	2	16581	WASHER-PLAIN 1/2
6	3	16586	LOCK WASHER 3/8"
7	2	16907	SCREW-HEX HEAD CAP 3/8-16 X 7/8
8	4	17160	SCREW-HEX HEAD CAP 1/4-20 X 3/4
9	1	19145	NUT-HEX LOCK (NYLON INSERT) #10-24
10	1	19149	FITTING-BRS.PLUG 1/8 MPT HEX SOCKET
11	4	19154	SPRAY NOZZLE-1/8 V- JET
12	2	19157	BEARING BLOCK-BRUSH
13	2	19158	BEARING SEAL
14	1	19161	PULLEY TIMING-MOTOR
15	12	19165	SCREW-PHILLIPS FLAT HEAD MACHINE #10-24 X 1/2
16	1	19166	PULLEY TIMING-MOTOR
17	1	19167	MOTOR-BRUSH
18	1	19189	FITTING-BRS.ADPT. 1/8 MPT X 3/8HB
19	1	19190	SPACER 5/16" DELRIN
20	1	19191	WASHER-PLAIN 5/16" SS
21	3	19207	SCREW-SLOTTED TRUSS HEAD MACHINE 3/8-16 X 3/4
22	2	19227	BEARING SLEEVE 3/4" (NYLINER)
23	4	19228	GASKET-BEARING BLOCK
24	1	19233	BELT-TIMING
25	1	30023	BRUSH HOUSING
26	1	30034	BRACKET-BRUSH LEVEL
27	1	30037	PLATE-BRUSH
28	1	30039	ADJUSTING SCREW
29	1	30045	MANIFOLD SPRAYBAR
30	1	30046	BRUSH-MARATHON 2000
31	1	30047	SHAFT-BRUSH
32	1	30057	GASKET-BRUSH PLATE
33	2	30064	BUSHING-BRUSH PIVOT
34	3	30075	WASHER-PLAIN 3/8
35	1	30562	KNOB
36	1	30569	BRACKET-SPRAYBAR HOLDER
37	1	30707	SPRING PIN
38	2	30920	NUT- LOCK NUT HEX #1/2-13
39	1	31053	BRACKET-BRUSH MOTOR MTG.

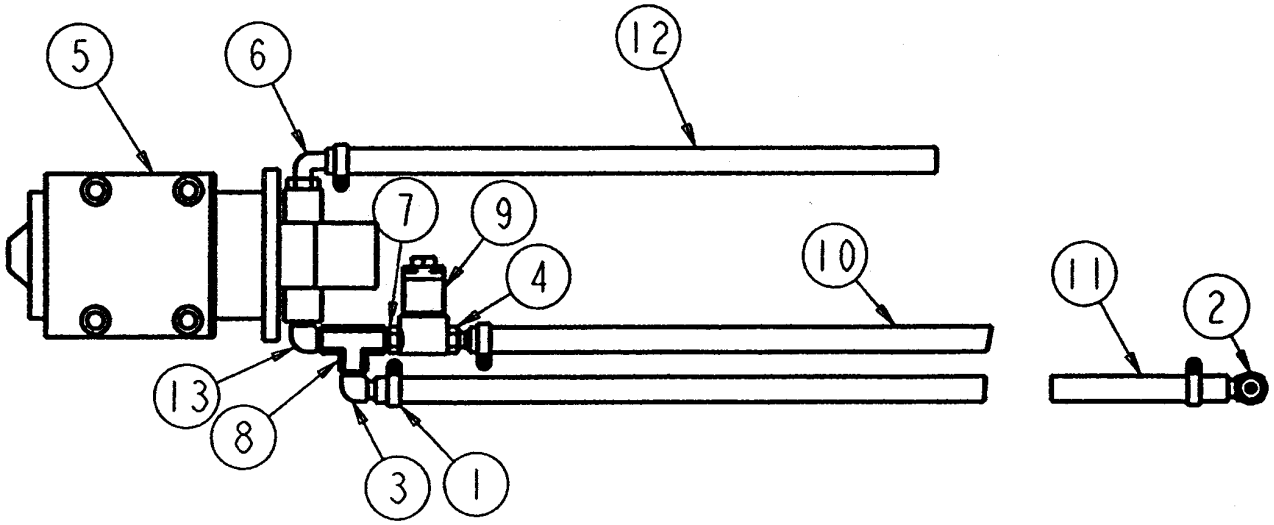
BRUSH ASSEMBLY
(REF. # 30643)



PUMP ASSEMBLY
(REF. # 30645)

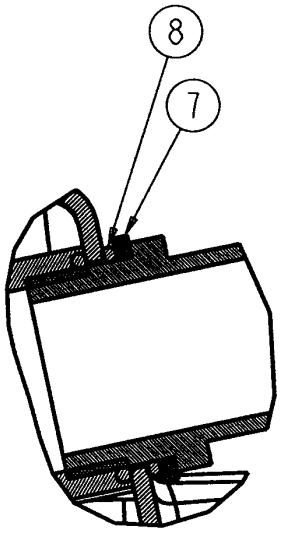
BILL OF MATERIALS			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	4	7626	CLAMP-HOSE 5/16"-7/8" SCREW
2	1	14881	FITTING QUICK CONN. NIPPLE X 1/4"FPT
3	2	15223	FITTING BRS.ELBW. 1/4"MPT X 3/8"HB
4	1	15505	FITTING BRS.ADPT. 1/4"MPT X 3/8"HB
5	1	16146	PUMP
6	1	18486	FITTING PLST 3/8"MPT X 3/8"HB
7	1	19185	FITTING BRS.CPLR. 1/4"MPT X 1/4"MPT
8	1	19187	FITTING BRS.TEE 3 X 1/4"FPT
9	1	19242	VALVE SOLENOID, 120V/60HZ
10	1	30572	HOSE - 3/8 I.D X 30.00 LG
11	1	30573	HOSE TEE-NIPPLE 3/8" X 40" LG
12	1	30574	HOSE - 3/8 I.D X 15.00 LG
13	1	30582	FITTING BRS.ELBW.1/4"MPT X 3/8"MPT
14	4	19190	MOUNTING SPACER *
15	4	19205	SCREW-PHIL. PAN HD MACH #10-24 X 1-1/4 (SS) *

* ITEM NOT SHOWN



RECOVERY DOME ASSEMBLY
(REF. # 30646)

BILL OF MATERIALS			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	19270	FITTING, MALE-COVER
2	1	30025	COVER-TOP TANK
3	1	30058	GASKET-COVER
4	1	30059	FITTING, FEMALE-COVER
5	1	30060	PIPE-COVER 1 1/4" PVC
6	1	30061	ELBOW-COVER 45 DEG. PVC
7	1	30062	WASHER-COVER
8	2	30063	O-RING -COVER



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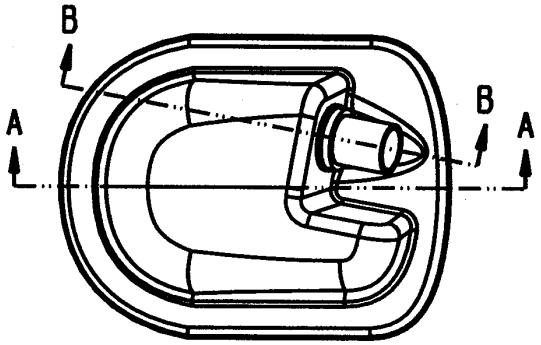

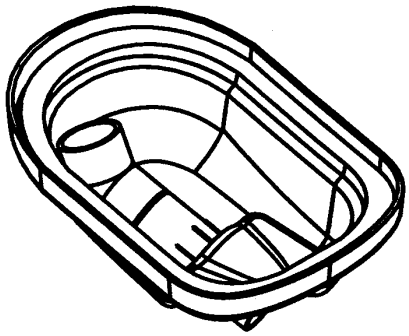

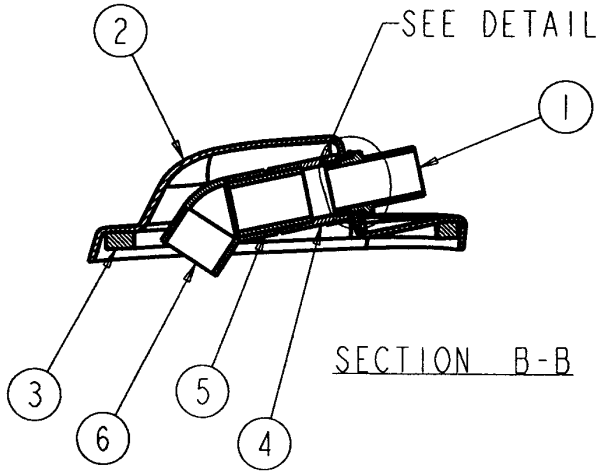

SECTION B-B

WIRING DIAGRAM
(REF. # 30702)